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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/519,282

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Daniel E Lenoski

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01/21/2005

THE LAW OFFICE OF KIRK D. WILLIAMS
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EXAMINER

MOORE, IAN N

ART UNIT

PAPER NUMBER

2661

DATE MAILED: 01/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/519,282	Applicant(s) LENOSKI ET AL.	
	Examiner Ian N Moore	Art Unit 2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on the amendment filed on 8-18-04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 6, 7, 9, 10 and 26-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 6, 7, 9, 10 and 26-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Independent claim 1 amended and new claims 26-28 are added.
2. Claims 2-5, 8, 11-25 are cancelled.

Response to Arguments

3. Applicant's arguments with respect to claims 1, 6, 7, 9, 10 and 26-28 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 7 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites the limitation "a particular packet" in line 3. It is unclear whether "a particular packet" in line 3 and "a particular packet" claim 1 refers to the same packet.

Claim 26 recites, "...the particular packet, ...one or more status data structure, includes **ANDing** a plurality of bit vectors..." in line 4. It is unclear what is being ANDing with a plurality of bit vectors. In particular, it is unclear whether ANDing is performed between
a) a plurality of bit vectors and one or more status data structure, or

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- b) a plurality of bit vectors and the particular packet, or
- c) a plurality of bit vectors and the particular path.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chiussi (U.S. 5,689,500) in view of Turner (U.S. 4,734,907).

Regarding claim 1, Chiussi'500 discloses a method preformed by a packet switch, the packet witch including one or more multistage interconnection networks (see FIG. 11, a first multistage interconnection network consists of input ASX 0-2, AXB 0-2 and output ASX 0-2; and a second multistage interconnection network consists of input ASX 3-5, AXB 3-5 and output ASX 3-5), each of said one or more multistage interconnection networks including a plurality of switching stages (see FIG. 11 input ASX 0-5, AXB 0-5 and output ASX 0-5) which include a first switching stage (see FIG. 11, ASX 1133) and final switching stage (see FIG. 11, ASX 1131), and one or more-intermediate switching stages in between the first and final switching stages (see FIG. 11, AXB 1132), said or more intermediate switching states including a broadcast component (see FIG. 11, backpressure processor 404 of AXB) the method comprising:

recognizing an error (see col. 13, lines 50-60; see col. 14, lines 21-26; the queue of record counter exceeds current threshold) within the packet switch (see FIG. 1, ATM or similar switch node; see col. 2, lines 26-32) by one of the plurality of switching stages (see FIG. 11, one of the output ASX module 1133);

sending a particular packet (see FIG. 12, backpressure bitmap message) from said one of the plurality of switching stages (see FIG. 11, one of the output ASX module 1133) to the broadcast component (see FIG. 11, backpressure processor 404 of AXB 1132) through at least a portion of said one or more interconnection network (see FIG. 11, a portion of one or more multistage interconnection network which comprises input ASX 0-5, AXB 0-5 and output ASX 0-5) in response to said recognizing the error (see col. 14, , lines 22-31; note that upon detecting the threshold crossing, a backpressure bitmap message is send toward AXB module 1132), the particular packet including an indication of the error (see FIG. 12, a bitmap message indicates the switch backpressure bit map); and

notifying a plurality of input component if the packet switch of the error (see FIG. 11, sending backpressure bitmap message to input/ingress side of the port cards 1110; see col. 14, lines 44-47), said notifying including sending one or more packets indicating the error from the broadcast component (see FIG. 1, a backpressure bitmap message is sent from backpressure processor 404 of AXB 1132 to ASX modules) through at least a second portion of said one or more interconnection networks (see FIG. 11, a portion of one or more multistage interconnection network which comprises input ASX 0-5 and AXB 0-5), said second portion including the final switching state (see FIG. 11, input ASX 1131; see col. 14, line 35-50).

Chiussi'500 does not explicitly disclose an indication corresponding to the broadcast component.

However, the above-mentioned claimed limitations are taught by Turner'907. In particular, Turner'907 teaches the particular packet including an indication corresponding to the broadcast component (see FIG. 4, BCN, broadcast control channel, and LCN, logical control channel; see FIG. 13A, a broadcast packet contains indication B for broadcasting, and indication BCN which corresponds to broadcast node (i.e. 362); see col. 4, lines 35, lines 35 to col. 5, lines 25; see col. 14, lines 20-45).

However, this limitation is taught by Turner'907. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Sheu'227, as taught by Turner'907 for the purpose of broadcasting a packet with broadcast indication over the stages of network within a switch since Turner'907 states at col. 1, lines that it will provide a high performance packet switch which is capable of efficient operation in broadcast mode. The motivation being that by broadcasting the packet via the stages within the switch with BCN and B indication, it can reduce the processing time/cost of a single node/component broadcasting to every node/component since the processing/load will be distribute to the secondary node/component will broadcast the rest of the network; thus increasing the performance of the packet switch. Moreover, by utilizing indication B and BCN, the system can easily identified the type of packet; see col. 4, lines 20-30.

6. Claims 6,7,9, 10, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiussi'500 and Turner'907, as applied to claim 1 above, and further in view of Soloway (U.S. 5,265,092).

Regarding Claim 6, Chiussi'500 discloses the input component updating in response to receiving a notification of the error (see col. 10, lines 1-5, col. 14, lines 44-51; col. 15, lines 1-27; note that upon receiving backpressure bitmap message at the ingress side of the port card, the input port card performs updating by stop sending the cells to that specified congested route and port).

Chiussi'500 does not explicitly disclose each component (see Soloway'092 FIG. 1, Switches 4a-4d) updating one or more status data structures (see Soloway'092 FIG. 2, Forwarding Table) in response to receiving a notification of the error (see Soloway'092 col. 3, line 1-23; note that LSP packet is send to each switch in the network in order to broadcast/notify the congested/failure/affected/error in the link. Upon receiving LSP packet, each switch updates the forwarding table accordingly).

However, this limitation is taught by Soloway'092. Note that Chiussi'500 teaches receiving a backpressure bitmap message/packet at each ingress side of the port module regarding the congested stages, and the each ingress side of the port performs updates by stop sending to that specified congested link. Soloway'092 teaches receiving LSP packets which indicates the links that are affected by the congestion/error at each switch in the network, and each switch update the routing accordingly by stop forwarding/routing to the specified affected link. Soloway'092's packet routing/switching technique/functionality can be used to modify Chiussi'500's switch. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Chiussi'500 and Turner'907, as taught by Soloway'092 for the purpose of receiving LSP packet and update the routing table at each switch accordingly, since Soloway'092 states in col. 3, lines 1-24 that it

will achieve loop-free routing of data packets. The motivation being that by updating the forwarding table in each switch upon receiving an LSP packet, it can readily switchover to available/configured route/path/link, which increase the routing efficiency and reduce the routing loop.

Regarding claim 7, the combined system of Chiussi'500, Turner'907, and Soloway'092 teaches each of the plurality of input components (see Chiussi'500 FIG. 11, Ingress side of port cards 0-17), a plurality of paths (see Turner'907 FIG. 11, links 1120, 1134, 1140) leading to a destination output component (see Chiussi'500 FIG. 11, Egress side of port cards 0-17) over which to send a particular packet (see Chiussi'500 FIG. 11, backpressure bitmaps message), and the data structure (see Soloway'092 FIG. 2, Forwarding table) as described above in Claim 6.

Soloway'092 discloses each of the plurality of components determining which of a plurality of paths leading to a destination component over which to send a particular packet, the path determined by referencing the one or more status data structures (see FIG. 2, forwarding table, and FIG. 4, Forwarding Process logic 40, Forwarding Table 36, Routing Logic 38, LSP Database; col. 3, line 15-5; note that the each switch re-computes/determines each route to the destination switch/end-node according to shortest path routing algorithm. Then after, the packets are routed according to the switchover or reconfigured paths/links toward the destination).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Chiussi'500 and Turner'907,

as taught by Soloway'092 by providing a mechanism to recomputed/re-calculate/determines the shortest paths/routes toward the destination in the forwarding table for the same reason stated in Claim 6 above.

Regarding claim 9, the combined system of Chiussi'500, Turner'907, and Soloway'092 teaches each of the plurality of input components (see Chiussi'500 FIG. 11, Ingress side of port cards 0-17), a plurality of paths (see Turner'907 FIG. 11, links 1120, 1134, 1140) leading to a destination output component (see Chiussi'500 FIG. 11, Egress side of port cards 0-17) over which to send a particular packet (see Chiussi'500 FIG. 11, backpressure bitmaps message), and the data structure (see Soloway'092 FIG. 2, Forwarding table) as described above in Claim 6.

Soloway'092 discloses wherein the one or more data structures include an output availability table to indicate whether a possible path through the packet switching system from the input component to a particular destination is available (see FIG. 2, forwarding table with hold down bit for channel 8a at switch 4d see col. 8, lines 12-61; note that when LSP packet indicates that channel 8a is the affected channel/link, the forwarding table is updated with hold-down bit as an entry for that particular channel/link. Thus, the channels/links toward the destinations, which are not indicated by the hold-down bit, are the available/candidate paths/links.)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Chiussi'500 and Turner'907 as taught by Soloway'092 by providing a mechanism to indicate the affected channel/link

toward the destination in order to determine/identify the available/candidate links for the same reason stated in Claim 6 above.

Regarding Claim 10, Chiussi'500 discloses disabling at least one of the plurality of input components from sending packets to a particular destination of the packet switching system when a path in the packet switching system leading to a particular destination falls below a predetermined threshold value as identified by one or more received packets containing indications of one more error (see col. 10, lines 1-5, col. 14, lines 44-51; col. 15, lines 1-27; note that the ingress side of the port card stops sending the cells to that particular congested route and output port of the packet switch after receiving backpressure bitmap message. A backpressure bitmap message is generated when the system detects that the acceptable threshold for cell transmission is exceeded in the path towards the destination; see col. 13, lines 49-67. As stated above 1 claim 1, a backpressure bitmap message contains congestion indication/error).

Chiussi'500 does not explicitly disclose a number of possible paths in the packet switching system leading to a particular destination.

However, this limitation is taught by Soloway'092. In particular, Soloway'092 disclose disabling at least one of the plurality components (see Soloway'092 FIG. 1, Switches 4a-4d) from sending packets to a particular destination through the packet switching system leading to a particular destination as identified by one or more received packets containing indications of one or more errors (see Soloway'092 FIG. 2, forwarding table with hold down bit for channel 8a at switch 4d; col. 8, lines 12-61; col. 3, line 1-23; note that LSP packet is

send to each switch in the network in order to broadcast and notify the link state. Upon receiving LSP packet, each switch updates the forwarding table accordingly. In particular, when the LSP packet indicates that channel 8a is the affected channel/link, the forwarding table is updated with hold-down bit as an entry for that particular channel/link. Thus, the channels/links toward the destinations, which are indicated by the hold-down bit, are the disable switches/links/paths).

Note that Chiussi'500 teaches receiving a backpressure bitmap message/packet at each ingress side of the port module regarding the congested stages, and the each ingress side of the port performs updates by stop sending to that specified congested link. Soloway'092 teaches receiving LSP packets, which indicates the links that are affected by the congestion/error at each switch in the network, and each switch, update the routing accordingly by stop forwarding/routing to the specified affected link. Soloway'092's packet routing/switching technique/functionality can be used to modify Chiussi'500's switch. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Chiussi'500 and Turner'907, as taught by Soloway'092 by providing a mechanism to indicate the affected/disable channel/link toward the destination for the same reason stated in Claim 6 above.

Regarding Claim 27, Chiussi'500 discloses wherein the predetermined threshold value is greater than one (see col. 13, lines 49-67; note that the acceptable/threshold queue size must be greater than one, since the queue is cell transmission queue in the ATM switch. The ATM switch queue is capable of handling more than one cell).

Regarding Claim 28, Chiussi'500 discloses disabling at least one of the plurality of input components from sending packets to a particular destination of the packet switching system when a path in the packet switching system leading to a particular destination falls below a predetermined threshold value (see col. 10, lines 1-5, col. 14, lines 44-51; col. 15, lines 1-27; note that the ingress side of the port card stops sending the cells to that particular congested route and output port of the packet switch after receiving backpressure bitmap message. A backpressure bitmap message is generated when the system detects that the acceptable threshold for cell transmission is exceeded in the path towards the destination; see col. 13, lines 49-67).

Chiussi'500 does not explicitly disclose a number of possible paths in the packet switching system leading to a particular destination.

However, this limitation is taught by Soloway'092. In particular, Soloway'092 disclose disabling at least one of the plurality components (see Soloway'092 FIG. 1, Switches 4a-4d) from sending packets to a particular destination through the packet switching system leading to a particular destination as identified by one or more received packets containing indications of one or more errors (see Soloway'092 FIG. 2, forwarding table with hold down bit for channel 8a at switch 4d; col. 8, lines 12-61; col. 3, line 1-23; note that LSP packet is send to each switch in the network in order to broadcast and notify the link state. Upon receiving LSP packet, each switch updates the forwarding table accordingly. In particular, when the LSP packet indicates that channel 8a is the affected channel/link, the forwarding table is updated with hold-down bit as an entry for that particular channel/link. Thus, the

channels/links toward the destinations, which are indicated by the hold-down bit, are the disable switches/links/paths).

Note that Chiussi'500 teaches receiving a backpressure bitmap message/packet at each ingress side of the port module regarding the congested stages, and the each ingress side of the port performs updates by stop sending to that specified congested link. Soloway'092 teaches receiving LSP packets which indicates the links that are affected by the congestion/error at each switch in the network, and each switch update the routing accordingly by stop forwarding/routing to the specified affected link. Soloway'092's packet routing/switching technique/functionality can be used to modify Chiussi'500's switch. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined system of Chiussi'500 and Turner'907, as taught by Soloway'092 by providing a mechanism to indicate the affected/disable channel/link toward the destination for the same reason stated in Claim 6 above.

Neither Chiussi'500, Turner'907, nor Soloway'092 explicitly discloses the number of possible path/threshold equal 1. Chiussi'500 teaches acceptable threshold of one or more cell in each queue for each link and stopping the cell transmission upon receiving backpressure message. Soloway'092 teaches having a forwarding table, which lists the affected links and non-affected links due to link error, and stopping the transmission towards the affected link. Setting the number of possible path/threshold to 1 does not define a patentable distinct invention over that in the combined system of Chiussi'500, Turner'907 and Soloway'092 since both the invention as a whole and the combined system of Chiussi'500, Turner'907 and Soloway'092 are directed to determining whether to stop or start sending cells/packets upon

error/backpressure message and stopping when the threshold is exceed or when the threshold exceeding message is received, so as to maintain the packet/cell transmission reliability and avoiding packet/cell lost in the network by controlling the congestion and other link error.

The degree in which determining threshold value presents no new or unexpected results, so long as the packet/cell transmission is maintained and no packet/cell are lost, and the packet/cell is processed and transmitted in a successful way. If one has less number of link thresholds to determine when to stop transmission, it will be provide excellent or good service which can be used for more delay/error sensitive cell/packet, and if one has more number of link thresholds, it will provide fair service which can be used for lesser delay/error sensitive cell/packet. Therefore, to have threshold path of 1, that to maintain the packet/cell transmission reliability and to avoid packet/cell lost in the network by controlling the congestion and other link error, would have been routine experimentation and optimization in the absence of criticality.

Allowable Subject Matter

7. Claim 26 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ian N Moore whose telephone number is 571-272-3085. The examiner can normally be reached on M-F: 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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10/1/04



BRIAN NGUYEN
PRIMARY EXAMINER